



ASN(RD&A) Cost Issues Group

presented at DODCAS 2009 DON
Session

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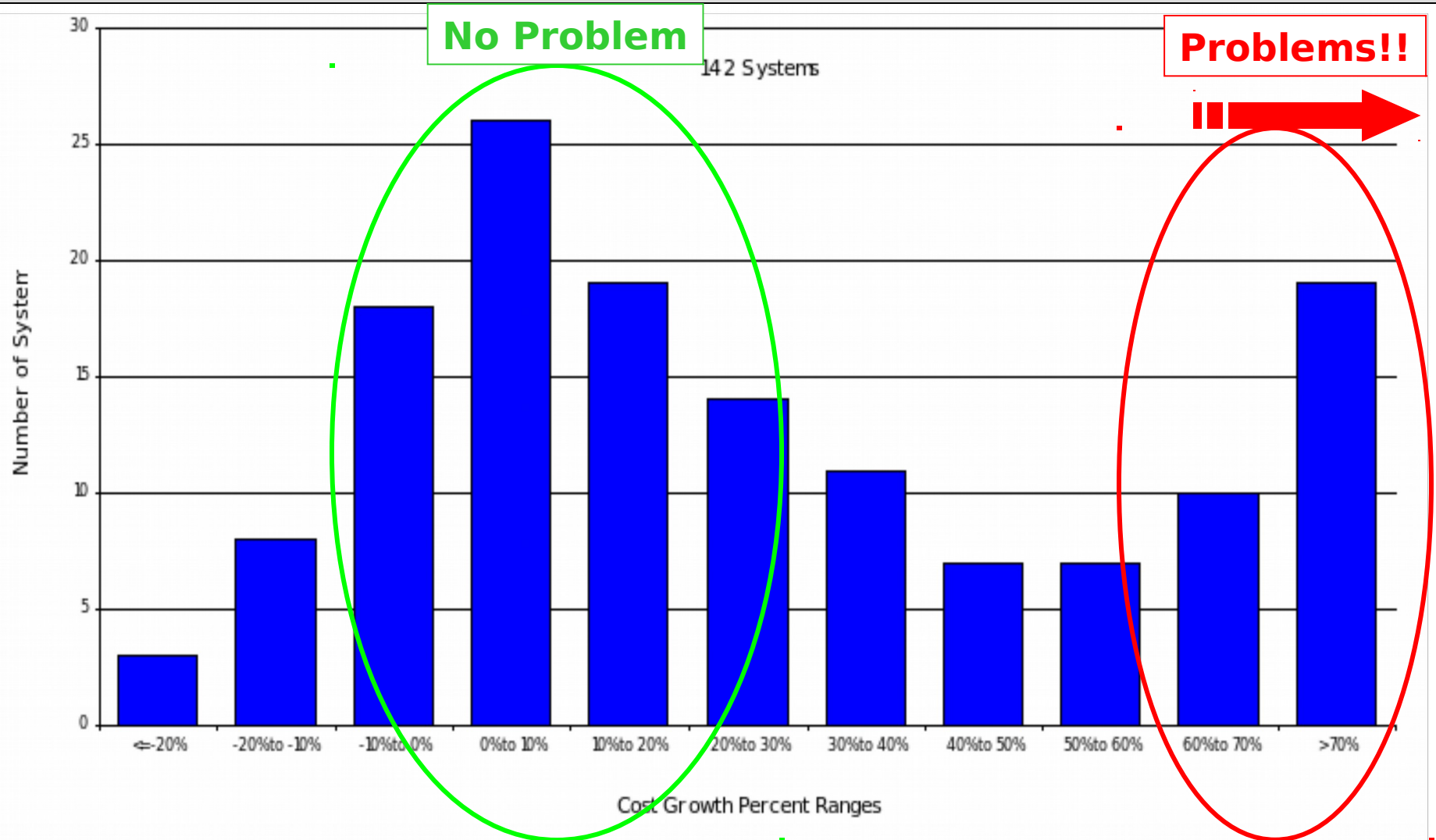


Background

- Called by ASN(RD&A) to address “cost estimating” issues
 - SECNAV/CNO: stop being surprised by 300% increases in program costs
 - The “easy target”: ***fix the cost estimates***
- 1-star, 2-star, SES-level attention from all stakeholders
 - Cost Estimating
 - Budgeting/Programming
 - Requirements
 - Engineering/Technical
 - Acquisition/Program Management
- Initiated group 23 Jan, met several times since
- Overarching issue is really “cost growth”



OSD Cost Growth Study





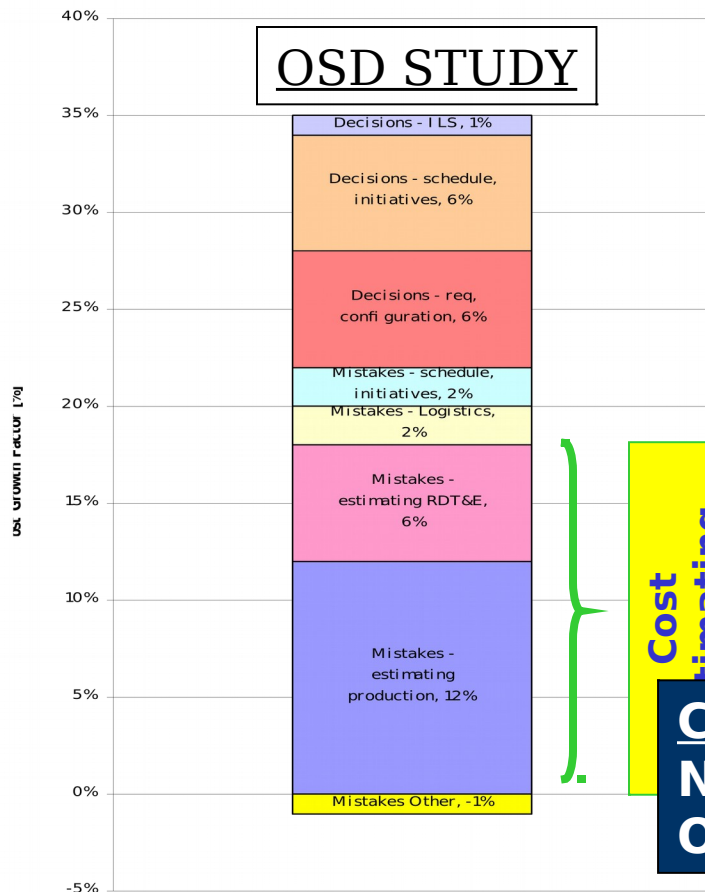
Cost Community Highlighted Program Cost Problem Areas

- **POPS criteria** for Cost Estimating is ineffective
 - Does not reflect validity of a cost estimate, **misleading** presentation of “confidence”
 - Cost estimate info is scattered throughout other POPS indicators
 - **Provides no insight** for decision makers; will always be red or yellow
- Cost uncertainty at early program phases is a result of **unreliable inputs**
 - Technical and programmatic descriptions of programs
 - **Technical, programmatic and requirements maturity**, variation issues
- Cost growth was more a function of **non-estimating issues**
 - Studies showed Cost Estimates accounting for 20%-40% of growth
 - **Schedule, technical and programmatic** accounted for 60%-80% of growth
- Mismatch between **budgeting, programming** and estimating processes
- Gave examples from NAVAIR, NAVSEA experience and metrics
- **“Cost estimating” is a small part of a very large issue!**



Cost Growth Study

Average Total Cost Growth



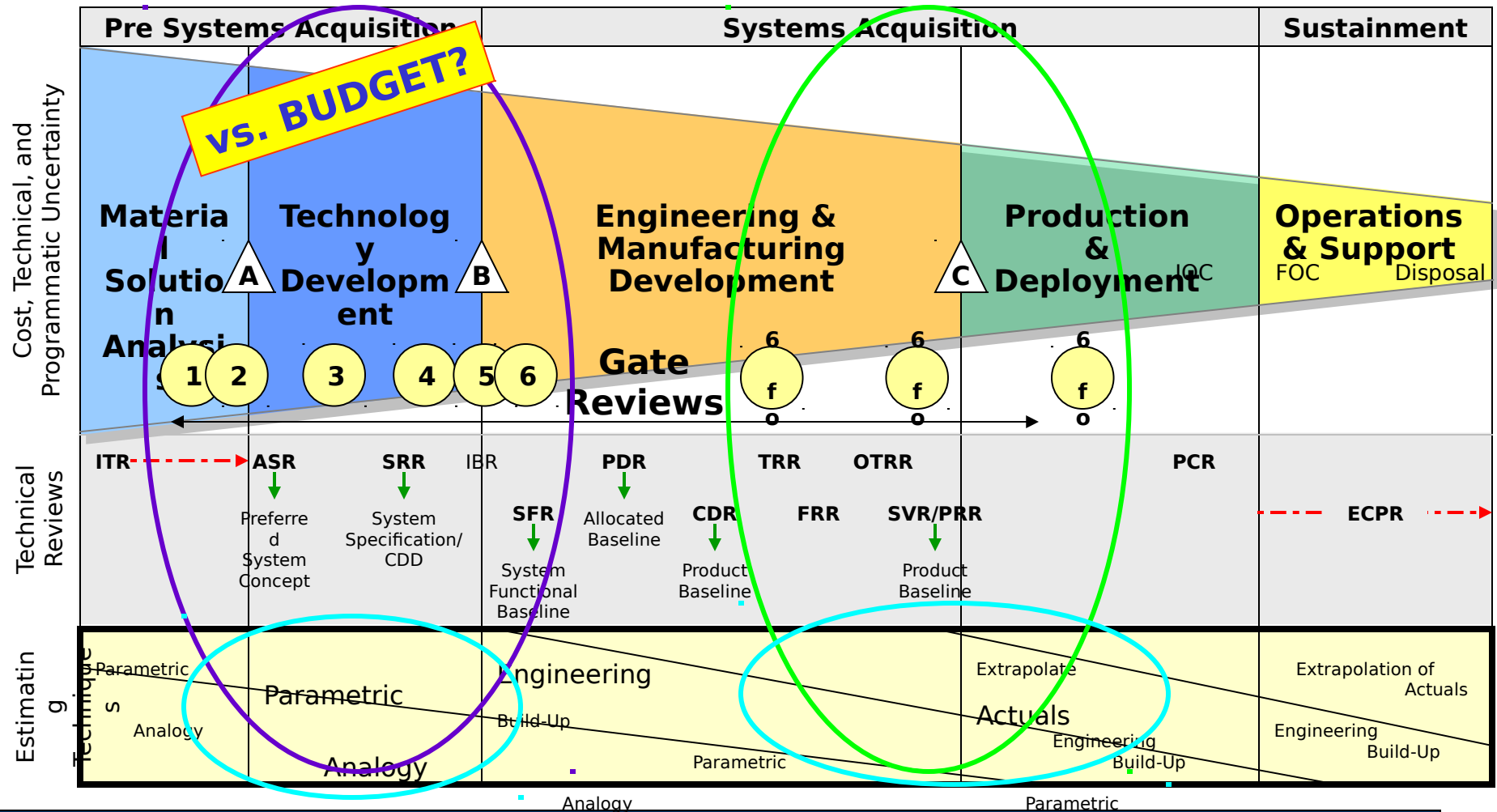
Average total cost growth of 142 DoD systems*	32%
Average total cost growth attributed to mistakes:	20%
<ul style="list-style-type: none"> Cost estimating (production phase) Cost estimating (RDT&E phase) Logistics Support Schedule, multiyear, and management initiatives Other 	12% 6% 2% 2% -1%
Average total cost growth attributed to decisions:	13%
<ul style="list-style-type: none"> Requirements, configuration changes, and variant changes Schedule, multiyear, and management initiatives ILS 	6% 6% 1%

*286 programs submitted SARs between 1969 and 2002, only 142 met the following criteria; 3-years of data past MS II, unclassified, procurement qty >0, complete data

Cost Estimating “contribution” to Cost Growth
NAVAIR Study: ~20%
OSD Study: ~50%



(You've seen this before!)





POPS Cost Estimating Criteria

		GATE 1	GATE 2	GATE 3	GATE 4	GATE 5	GATE 6
C O S T E S T I M A T I N G	Plan to conduct cost estimates has been developed; all stakeholders actively involved	GREEN - Plan for cost estimates have been developed; all stakeholders involved					
		YELLOW - Plan for cost estimates are being developed; key stakeholders involved					
		RED - Plan for cost estimates NOT been developed					
	Cost estimate range to address potential capability alt. have been developed and dropped	GREEN - developed and approved	GREEN - can be evaluated				
		YELLOW - being developed	YELLOW				
		RED - NOT being developed	RED - can NOT be evaluated				
	Cost estimating activities are on or ahead of schedule. Appropriate technical authorities and stakeholders are involved to ensure total ownership cost implications are being addressed	GREEN - ahead of schedule	GREEN - ahead of schedule	GREEN - ahead of schedule	GREEN - ahead of schedule	GREEN - ahead of schedule	GREEN - ahead of schedule
		YELLOW - behind schedule but not affecting planning/execution	YELLOW - behind schedule but not affecting planning/execution	YELLOW - behind schedule but not affecting planning/execution	YELLOW - behind schedule but not affecting planning/execution	YELLOW - behind schedule but not affecting planning/execution	YELLOW - behind schedule but not affecting planning/execution
		RED - behind schedule and affecting planning/execution	RED - behind sched. & affecting planning/execution	RED - behind sched. & affecting planning/execution	RED - behind sched. & affecting planning/execution	RED - behind sched. & affecting planning/execution	RED - behind sched. & affecting planning/execution
	Cost Estimate confidence level is about 75%		>75%	>80%	>85%	>90%	>95%
			25-75%	50-80%	60-85%	75-90%	80-95%
			<25%	<50%	<60%	<75%	<80%
	Initial independent CE has been accomplished by an org. outside the PORC. Less than 10% diff. btwn the P.O. and initial ind.cost estimator. Diff. in assumptions and methodologies have been resolved.			difference. All diff. have been resolved	difference. All diff. have been resolved	difference. All diff. have been resolved	difference. All diff. have been resolved
				YELLOW: 10-30% difference. All diff. are resolvable	YELLOW: 10-30% difference. All diff. are resolvable	YELLOW: 10-30% difference. All diff. are resolvable	YELLOW: 10-30% difference. All diff. are resolvable
				RED: >30% difference. All diff are NOT resolvable	RED: >30% difference. All diff are NOT resolvable	RED: >30% difference. All diff are NOT resolvable	RED: >30% difference. All diff are NOT resolvable

“Is there a Plan to get an Estimate?”

“Are CE activities on-schedule?”

Cost Estimate confidence level is about 75%



Recommendations

- Look at POPS reporting
 - Fix those “insight” disconnects for a more meaningful indicator
- Add “technical/programmatic” non-advocate reviews
 - Remove some of the “optimism” from program definitions
- Improve SE process and early acquisition phase flow
 - Attain a higher maturity before committing to a program
- Review “S-curve” understanding and usage
 - Gain a better view of the potential upper-range bounds
- Align budgeting and programming expectations
 - Reduce the risk of “cost growth surprises” with added risk funds?

Cost Estimating POPS Criteria
Green: cost estimates provide sufficient insight to reflect expected program costs
Yellow: cost estimates are adequate in major areas, but lack in some detail or areas that cause concern regarding projection of expected program costs
Red: cost estimates lack in significant areas and do not provide sufficient insight into expected program costs
cost estimate criteria reflect a composite assessment of two primary elements: (1) cost processes, and (2) data (cost information data and program description information)

Cost Insight - SAMPLE

		Is this information relevant or significant to assess the insight provided by the cost estimate at the respective Gate?							
	Gate:	1	2	3	4	5	6	6-LRIP	6-FRP
Cost data		ICD	AOA	CDD/CONOPS	SDS	RFP	IBR	MS-C	FRP-DR
Measures amount and availability of reliable, relevant, valid cost data with which to estimate the program. Includes historical and actual costs, technical, and programmatic information. Low availability of relevant, reliable cost data will yield inaccurate and unreliable cost estimates.									
	ANALOGOUS PROGRAMS	YES	YES	YES	YES	MAYBE	MAYBE	MAYBE	NO
	CPR, CFSR, CDDR, CSDR (EVMS)	NO	NO	NO	MAYBE	MAYBE	MAYBE	YES	YES
	PARAMETRIC DOF	MAYBE	MAYBE	YES	YES	YES	YES	YES	YES
	BOM	NO	NO	NO	NO	NO	MAYBE	YES	YES
	FPRA, RATES	NO	NO	MAYBE	MAYBE	YES	YES	YES	YES
	PROGRAM SCHEDULE/PROFILE	NO	YES	YES	YES	YES	YES	YES	YES
Program description information									
Measures maturity, stability, and thoroughness of program description information upon which cost estimate is based. Incomplete, partial, or "ball park" descriptions of the program will yield unreliable cost estimates.									
	CONOPS	NO	MAYBE	YES	YES	YES	YES	YES	YES
	CDD	NO	MAYBE	YES	YES	YES	YES	YES	YES
	ICD	YES	YES	MAYBE	NO	NO	NO	NO	NO
	TRL	NO	MAYBE	YES	YES	YES	YES	YES	YES
	SDS	NO	NO	NO	YES	YES	YES	YES	YES
	CARD	NO	NO	YES*	YES*	YES	YES	YES	YES
	ACQ STRATEGY	NO	MAYBE	YES	YES	YES	YES	YES	YES
	IMS/SCHEDULE	NO	MAYBE	YES	YES	YES	YES	YES	YES
	AOA	MAYBE	YES	YES	MAYBE	NO	NO	NO	NO
Cost Estimating Process									
Measures use of best practices in developing the estimate. Missing steps or elements of best practices potentially yields cost estimates that lack in credibility or potential to offer full insight.									
	COST WMPT/TEAMING	MAYBE	YES	YES	YES	YES	YES	YES	YES
	ICE	NO	NO*	YES	YES	YES	YES	YES	YES
	WBS/CES	NO	YES	YES	YES	YES	YES	YES	YES
	COST DRIVER IDENTIFICATION	MAYBE	YES	YES	YES	YES	YES	YES	YES
	VALIDATION REVIEWS	NO	YES	YES	YES	YES	YES	YES	YES
	SENSITIVITY ANALYSIS	NO	YES	YES	YES	YES	YES	YES	YES
	RISK ASSESSMENT	NO	YES	YES	YES	YES	YES	YES	YES
	DOCUMENTATION	NO	YES	YES	YES	YES	YES	YES	YES
	UPDATE WITH ACTUALS	NO	NO	NO	NO	MAYBE	MAYBE	YES	YES
	METHODOLOGY SELECTION	NO	YES	YES	YES	YES	YES	YES	YES
	DEFINED ASSUMPTIONS	NO	YES	YES	YES	YES	YES	YES	YES

Cost Estimating POPS Criteria				Σ		Σ		Σ	
Green: Data and process are best practice				≥ 1		≥ 3		≥ 12	
Yellow: Data and/or process is less than optimum									
Red: Data and/or process is NOT best practice				≤ -1		≤ 3		≤ 9	
	Milestone			2		5	A	17	B
Ratings: 1 for "yes", -1 for "no or not applicable"	Gate	1		2			3 and 4 if 4 is not in preparation for MS B		4 and 5 if 5 is in preparation
Cost Estimating Objective		Criteria		Weighting		Weighting		Weighting	
TRLs provide insight into the maturity of a materiel solution.	TRL for each major subcomponent	= or > 3	1	= or > 4	1	= or > 5		5	= or > 6
Best practice is to have a Cost WIPT for vetting issues.	Cost WIPT	Has the cost WIPT met?	1	Is the Cost WIPT meeting "regularly"	1	...		1	...
Cost estimates are made for each alternatives with sufficient detail for costing.	AoA			Alternatives are defined and estimated.	2	Materiel solution selected in AoA is accurately reflected in CDD		2	
The CARD should reflect the Program of Record (POR) in sufficient detail it can be used to cost the program.	CARD			Is there a plan for developing a CARD?	1	Is there a draft CARD that reflects the CDD?		2	Does the CARD agree with CD has it been validated by the te community?
A BOM reflects a detailed understanding of the materiel solution which is essential for quality estimates.	Bill of material					Is there a BOM?		1	Is the BOM reflective of the Ca solution?
Variability in the POE and/or SCP from year-to-year is an indicator of program definition (SCP only applies to ACAT 1D programs).	POE/SCP					Has a POE been briefed to senior leadership?		1	Has a SCP been established? POE/SCP LCCE changed less the prior gate? .AND. Cost gr year in the previous gate review less than \$100M from the curr
Variation between the ICE and POE/SCP (POE or SCP as appropriate) is an indicator of program definition.	ICE					Has a CCE (component cost estimate) been established?		1	Is the ICE within 50% the POE estimate?
Cost risk should decline with program maturity.	Risk Assessment					Has a risk assessment been completed?		1	Have cost been assigned each has a cost range been established point estimate?
Best practice requires cost reporting.	Cost Reporting					Has a single WBS been established that is used by the contractor and government? .AND. Has an EVMS plan been established?		3AND. Is EVMS data being rep a CCDR plan approved by OSI implemented?



Reactions

- Group endorsed Cost Community position
- Directed to “attack the issue” from three perspectives
 - Engineering, Technical and Programmatic ASN(RDA) CHSENG lead
 - Definitions, maturity, technical insight through Gate Reviews
 - Requirements and programmatic stability
 - Cost Estimating DASN(C&E) lead
 - POPS Criteria, S-curves, upper-limits of uncertainty/ranges
 - Best Practices, post-mortem metrics?
 - Budgeting and Programming OPNAV N8 lead
 - How to use the output
 - Address “time based” budgeting versus “event based” programming
 - Significant impact: **HOW TO USE THE COST ESTIMATE and RANGE**



Questions?

MARSHALL
GRANT The Clinton-Edger
COPART 1988 1989

